Metal Free and Visible Light Promoted Synthesis of Isothiazoles

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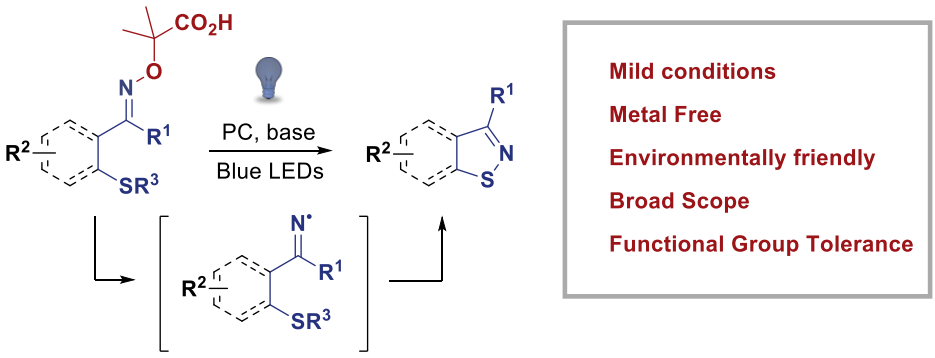
Isothiazoles are important scaffolds in medicinal chemistry and agriculture industry. This prominent moiety occurs in various antipsychotic drugs, some inhibitors of biological targets and different pesticides.[1] Traditional methods for the preparation of these heterocycles often require harsh conditions, high temperatures or the use of transitions metals.[2] Therefore, a simple, direct and sustainable approach towards the synthesis of isothiazoles would be of significant interest.

Photoredox catalysis mediated by visible light has received much attention in the past decade.[3] Its mild and green conditions have made it a suitable option to develop new efficient, economical and environmentally friendly transformations. In particular, in the last years iminyl radicals, versatile synthetic intermediates in the construction of more complex molecules, have been successfully generated from oxime derivatives through a photoredox approach, avoiding the UV irradiation or high temperatures previously required.[4]

On this basis, and taking advantage of our experience in sulphur chemistry, we envisioned that iminyl radicals generated by oxidative SET could be appropriate for the formation of S−N bonds, although to the best of our knowledge it has not been reported to date. Herein, we describe the efficiently realization of this approach and we apply it in the development of a new synthesis of isothiazoles from α-imino-oxy acids using mild conditions and promoted by visible light.[5]



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